

42nd Annual State Construction Conference

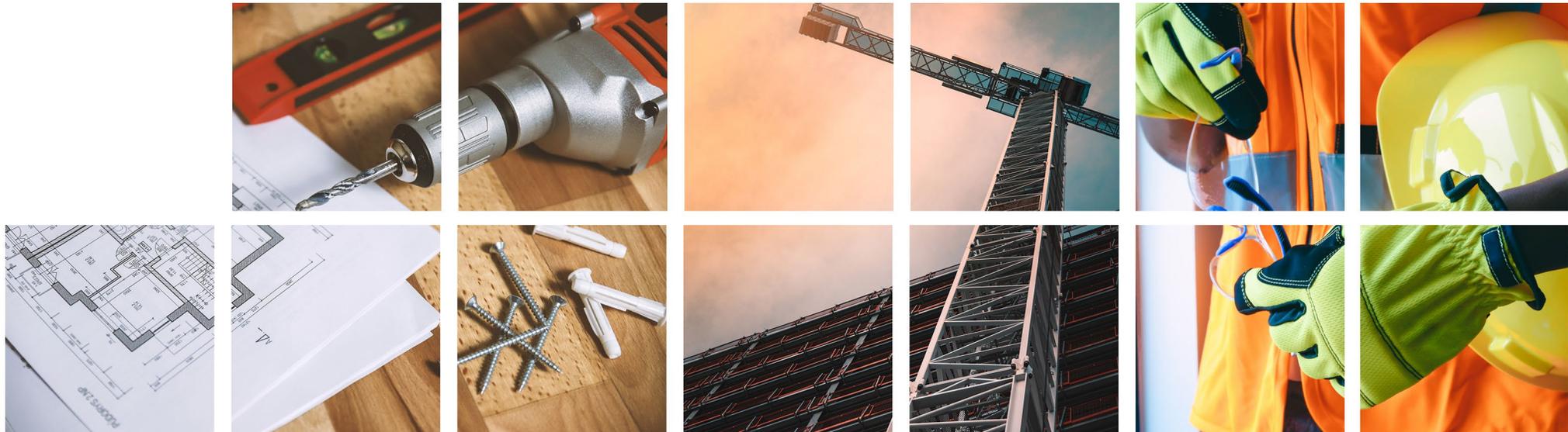
March 2, 2023



NC★DOA
Department of Administration
State Construction Office

Prevention through Design

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“Too often we’re focused on what a worker who falls and dies did or didn’t do, when we should be looking at what supervisors, managers, facility owners, or engineers did to anticipate the risk and prevent that outcome”

- **What do you see?**
- **Would you design something differently?**
- **What?**



- Is it “foreseeable” if you were involved in the design and placement of the HVAC equipment?
- Or is it just foreseeable now because you’re in a discussion on safe design?



My Journey in Safe Design...



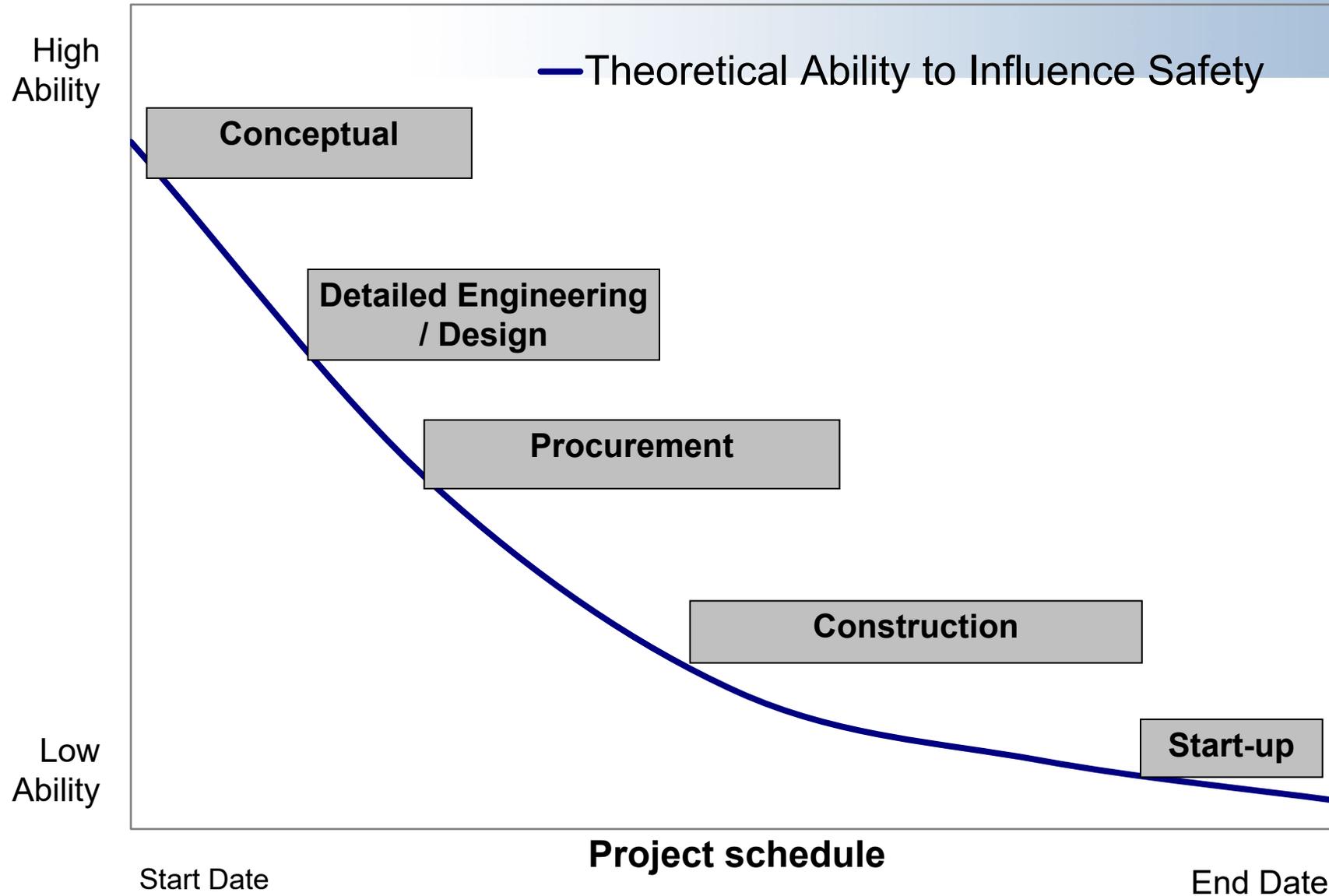
CAPTAIN HINDSIGHT

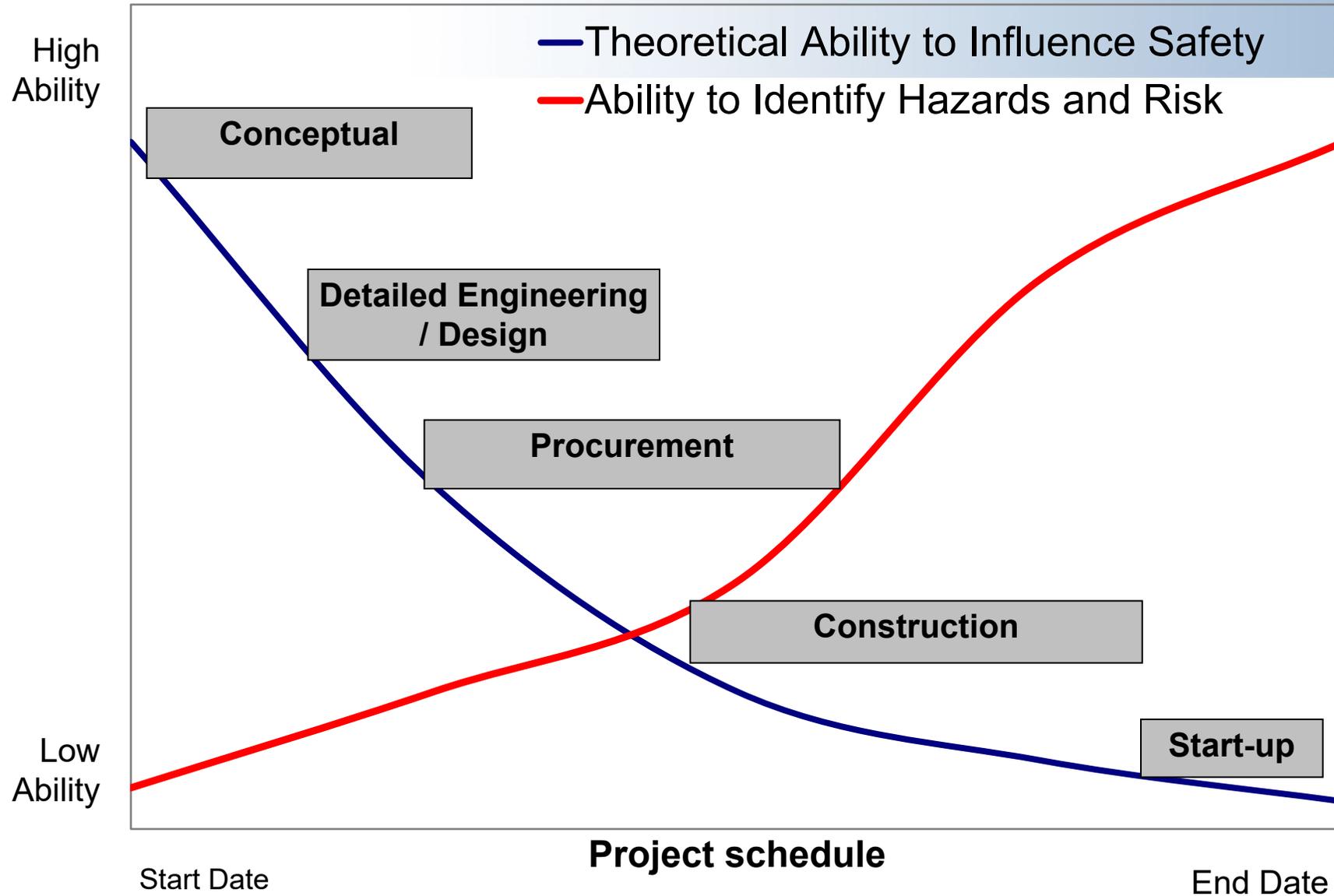
Never saves people, just tells what should have been

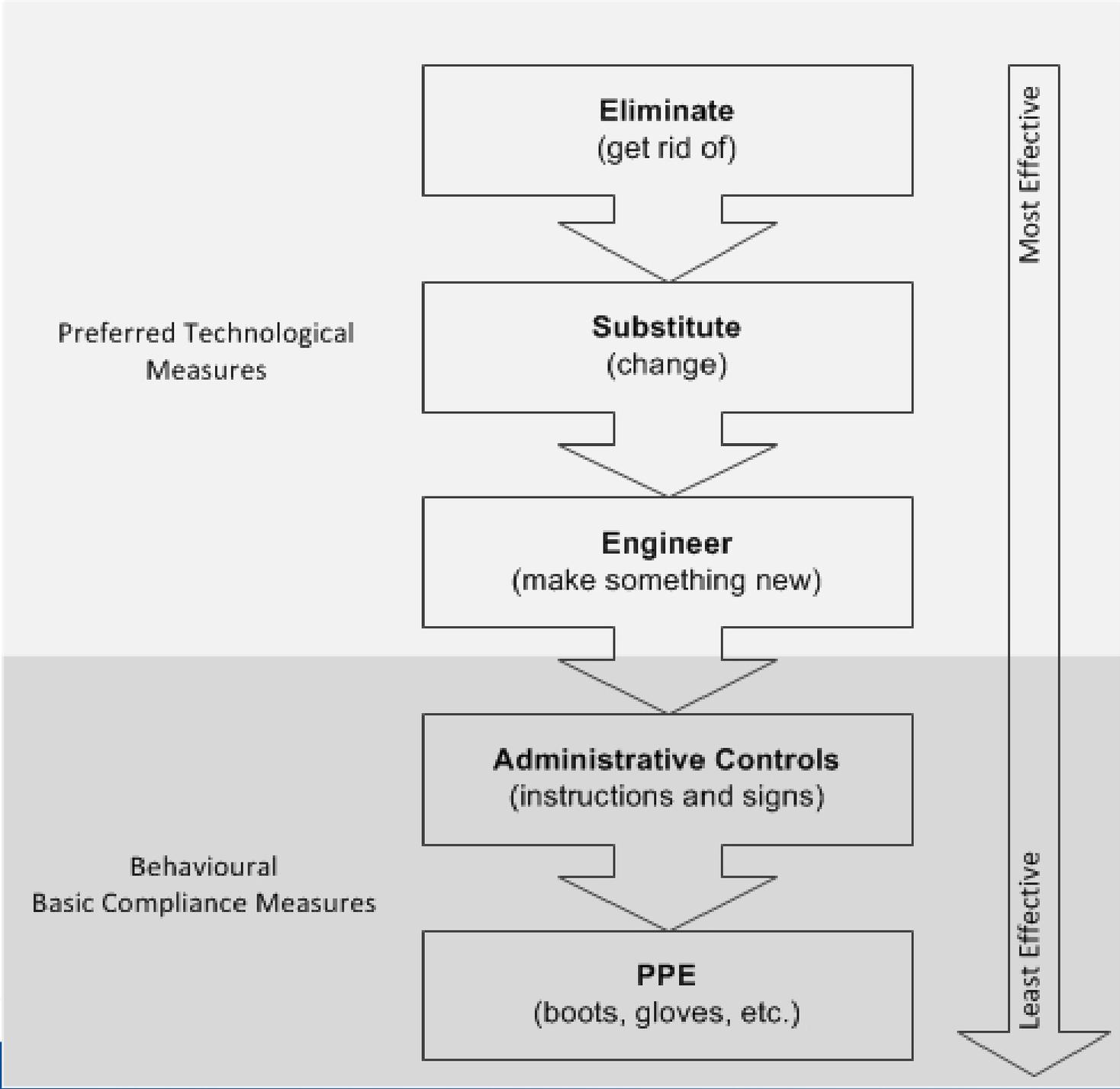
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A Global Look at PtD



Regulations



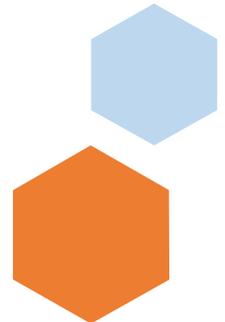
Practice



Examples



Research



No Worries... We can fix things and make them all good...

How a lack of Anticipation and Foreseeability can get you into trouble





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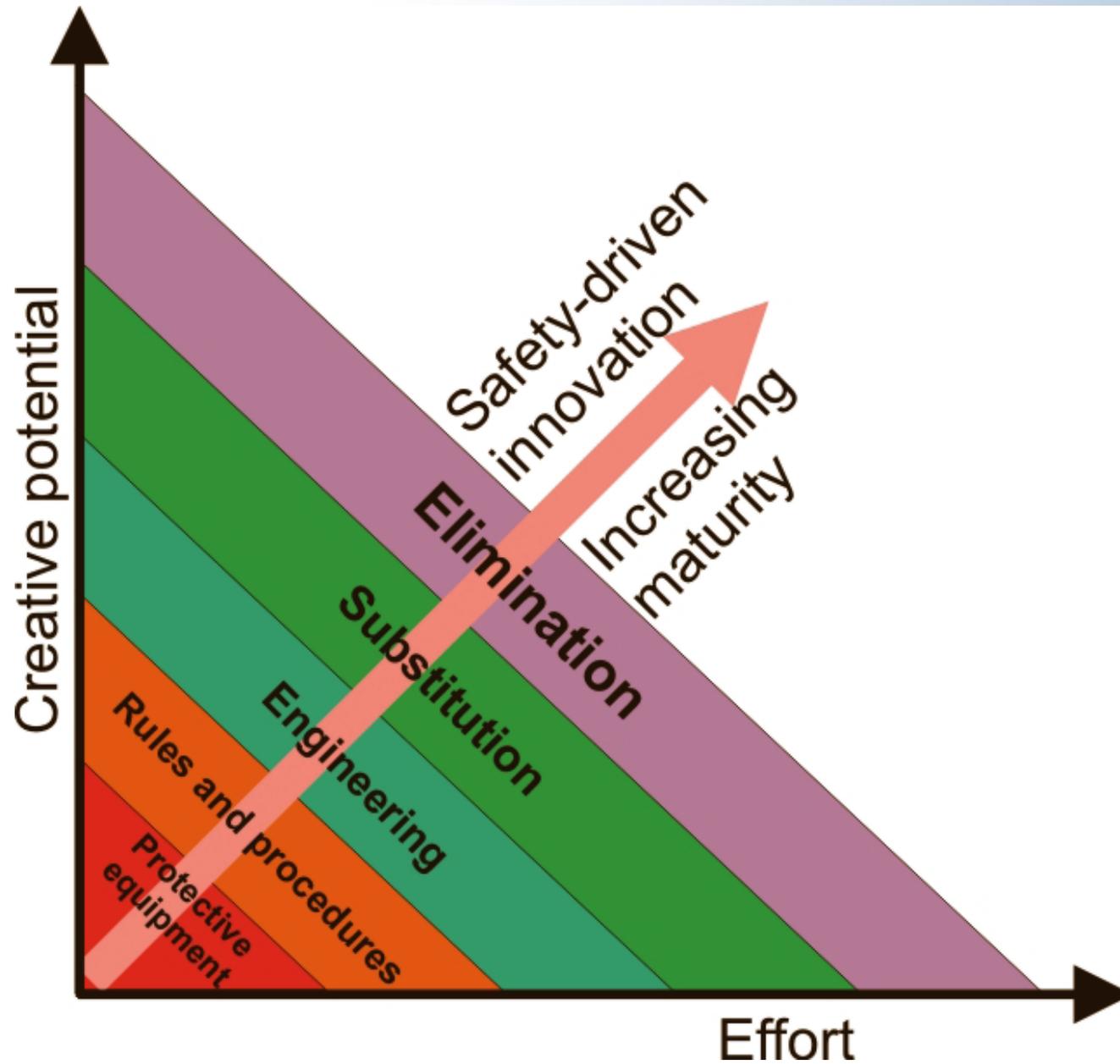


Does Design Matter?

A brief mention of its role in accidents

Safe Design: A Source for Innovation and Creativity

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2023 State Construction Conference Source: Culvenor, J. 2006.

Petrol Station Construction Example

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14/07/2008

An opportunity for creativity

- “The results from the design of the telescoping canopy have been very encouraging; the total man hours required to work at height on canopy installations has been reduced by 95 per cent, almost eliminating the need to have workers exposed to risks associated with such work.
- The telescopic column canopy has also reduced the critical path of a construction timeline of a site by 7 to 10 days on average.”

Obvious after the creative effort

- **The obvious path at the start**
 - Anchor points, horizontal lifeline, communicate the fall hazard.
 - More cost, better safety
- **The obvious way after creative effort**
 - After finding out the things we didn't know
 - Safer, faster, cheaper

The example as an innovation

- Technological change driven by...
- Organizational lateral thinking
 - Beyond compliance view
 - Market differentiation
 - “Safety in design is one area where we can use safety to gain a market edge and differentiate ourselves from our competitors”.

Schindler's Robotic Installation System for Elevators

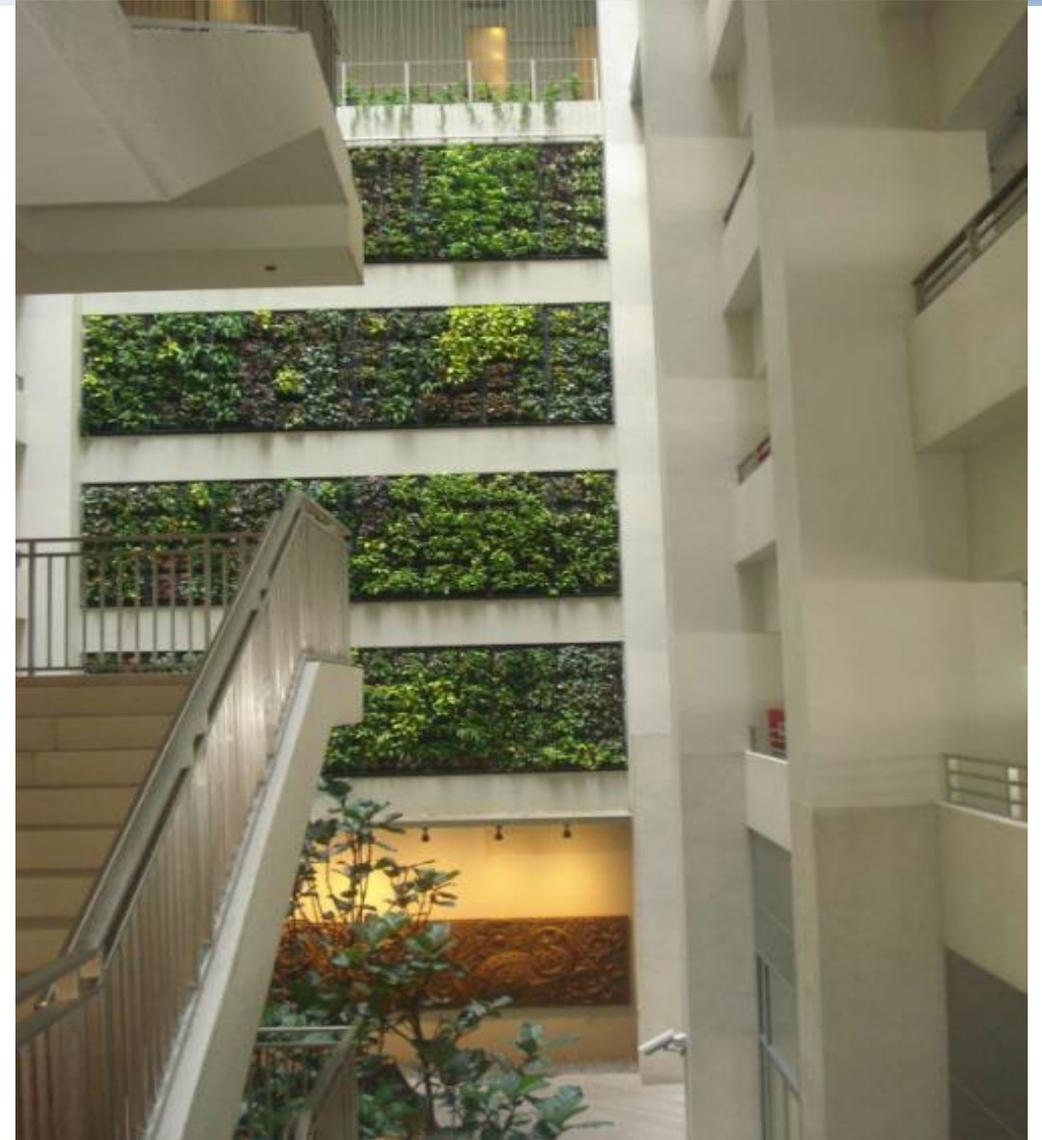


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Another example if we have time...

If not skip 4 slides

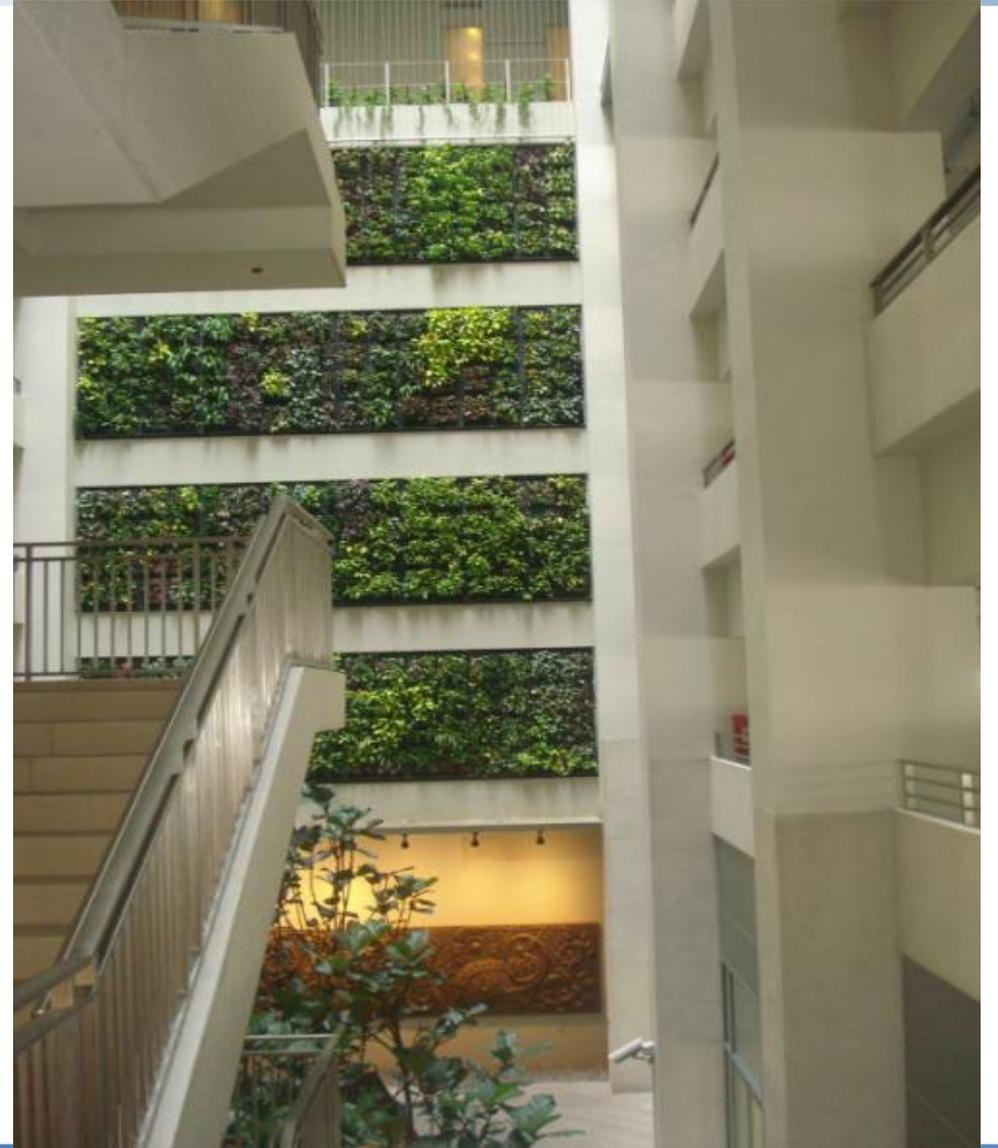
How can we maintain this green wall?



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How can we maintain this green wall?

- Aerial lift
- Ladders
- Scaffolding
- Gondola like system
- Workers on stilts
- It's maintenance free!



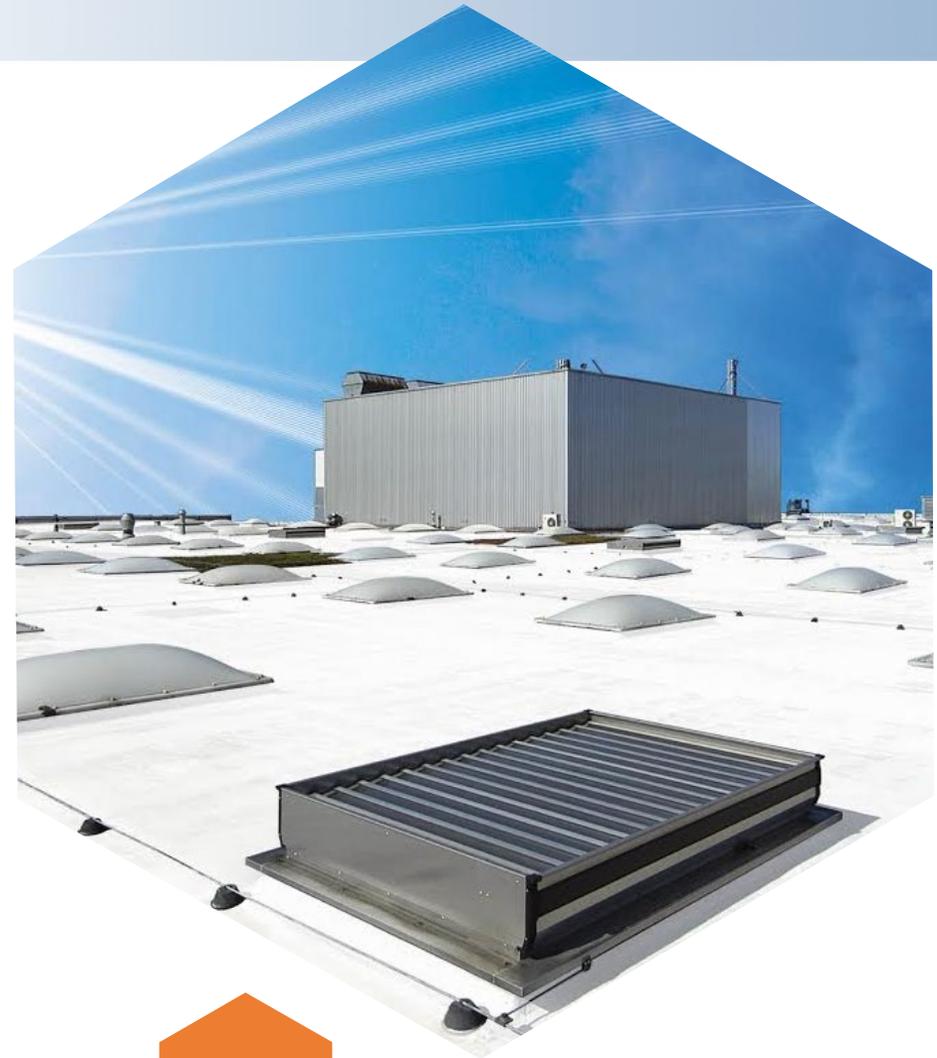
Easy and safe worker access allows the green wall to be easily maintained at any time and without much planning.





“French doors” allow the greenery to come to the worker. The camouflaged guardrail is aesthetically pleasing and is a passive control that allows workers to safely maintain and replace the vegetation without much planning.

What should we do?



State Construction Manual

Section 403

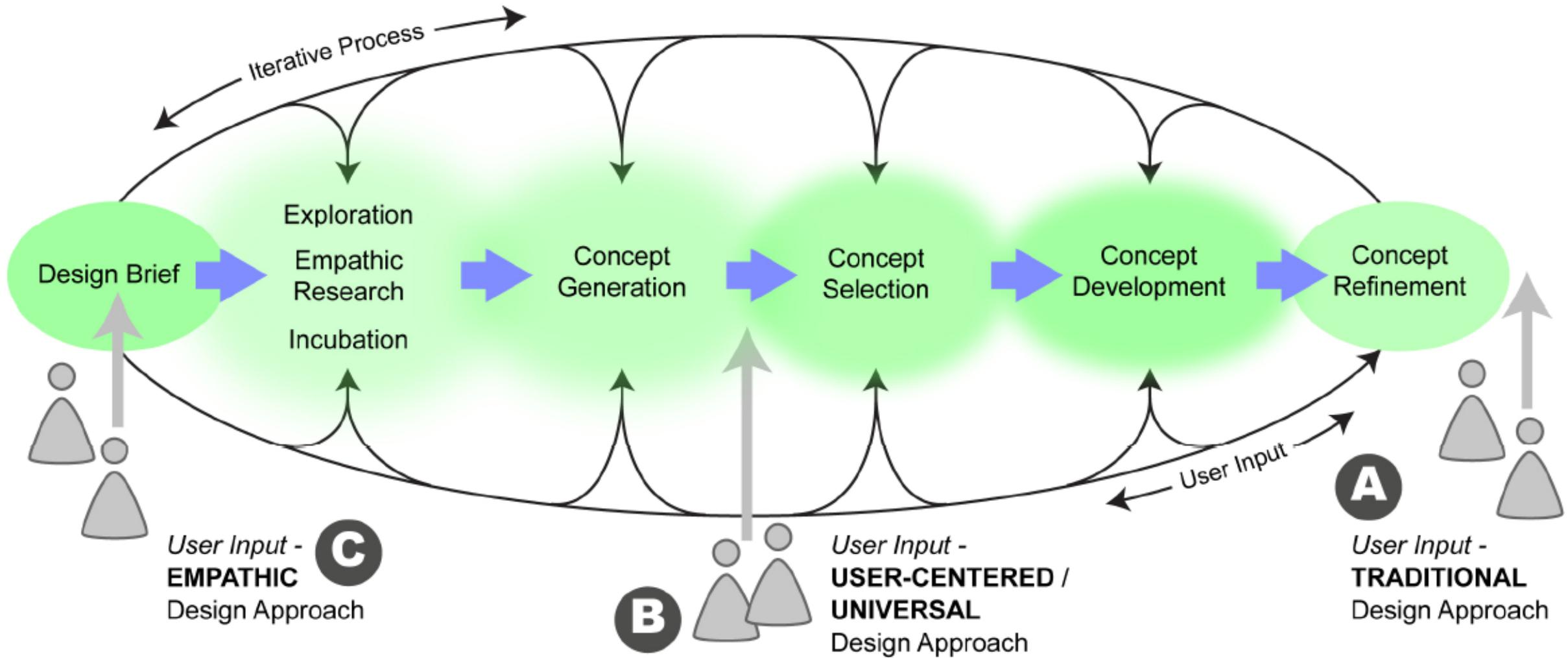
Owner Review

The owning agency or institution of a capital project may not be a regulatory Agency, but their review and approval is the most important in the process. The public funds were appropriated to the owning Agency for facilities to support a program or service provided by the State or Community College. It is important that the Owner approve all plans submitted prior to their transmittal to the State Construction Office and other review entity.

The Owner is the most familiar with the program, staff, spaces and overall operation, and needs to ensure that the design, materials, equipment and systems meet those needs and that the project is within the scope and funds established by the appropriation or budget.

The Facilities Management department of each owning agency or institution must, by State Building Commission Rules, be a major participant in the design, review and approval of any capital project to ensure that not only the scope and program are addressed, but that the maintenance, serviceability, life safety and environmental support systems operate safely, effectively and efficiently over the life of the building.

The Capital Projects Coordinator (CPC) shall be responsible for ensuring that facilities maintenance personnel are fully involved in the review and input provided to the Designer. Their comments should also be included with the Owner's review and approval letter to the State Construction.



Possible strategies for State

- Examples showed were industry specific innovations
- CHAIR - Recommends design charrettes to consider construction, operations and maintenance health and safety at about 30% and 60% design completion. Uses keywords for brainstorming
- I suggest you begin with a focus on operations and maintenance – involve workers
- Build up your knowledge and your knowledge database

CHAIR
SAFETY IN DESIGN TOOL



Parting points

Bad safe design forces a “check box” mentality.

Don't pretend you can write everything down about safe design.

It's NOT designing to rules and specifications.

It's about a mindset of the design team about what safety in design means.

But being creative.

Finding out what we don't know.

Thank you

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